

INTRODUCTION

To design a foundation that will adequately support a structure, an engineer must understand the type of soil deposits that will support the foundation.

Moreover, foundation engineers must remember that soil at any site frequently is non-homogeneous-that is, the soil profile may vary. Soil mechanics theories involve idealized conditions, so the application of these theories to foundation engineering problems involves judicious evaluation of site conditions and soil parameters. To do so require some knowledge of the geological process by which the soil deposit at the site was formed, supplemented by subsurface exploration. Good professional judgment constitutes an essential part of geotechnical engineering-and it comes only with practice.

This chapter is divided into two parts. The first is a general overview of natural soil deposits generally encountered, and the second describes the general principles of subsoil exploration.

NATURAL SOIL DEPOSITS & SOIL ORIGIN

Most of the soils that cover the earth are formed by the weathering of various rocks. There are two general types of weathering:

- (1) Mechanical weathering
- (2) Chemical weathering.

Mechanical weathering is the process by which rocks are broken into smaller and smaller pieces by physical forces. These physical forces may be running water, wind, ocean waves, glacier ice, frost action, and expansion and contraction caused by gain and loss of heat.

Chemical weathering is the process of chemical decomposition of the original rock. In the case of mechanical weathering, the rock breaks into smaller pieces without a change of chemical composition. However, in chemical weathering, the original material may be changed to something entirely different. For example, the chemical weathering of feldspar can produce clay minerals.